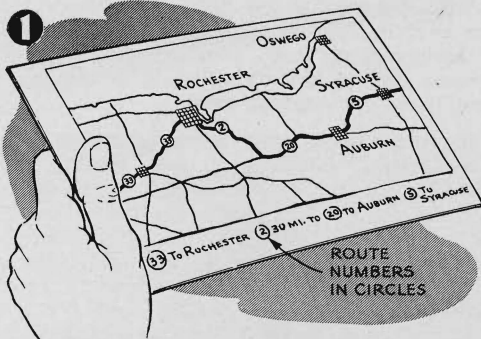
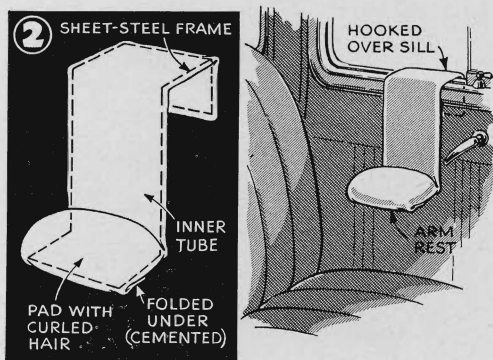


# SEVEN HANDY TIPS



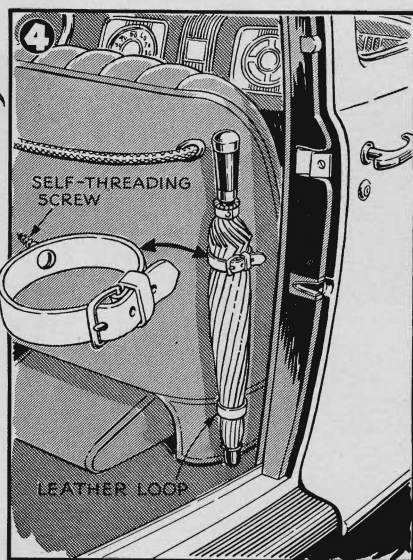
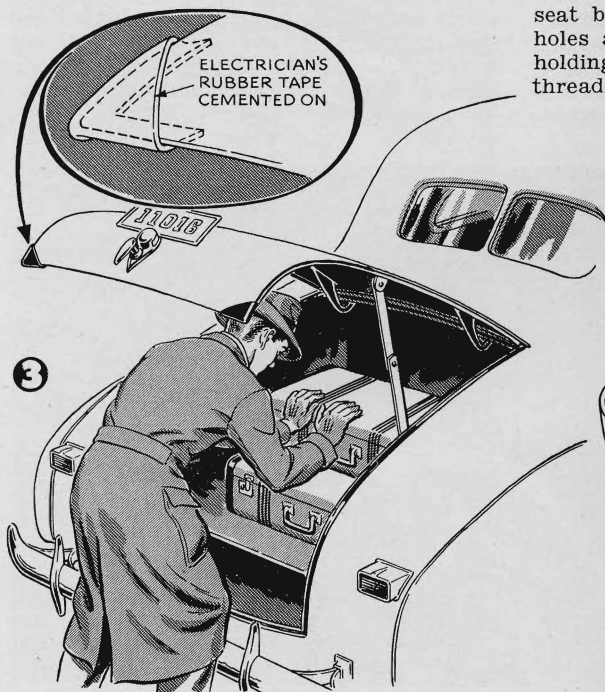
**1 EASILY HANDLED STRIP MAPS** for your cross-country motor trips can be made from ordinary road maps. Cut out the section of the map your route covers and paste it on a card, leaving a space at the bottom. In this space, print the highway numbers and distances between highway junctions, as shown at left.—D.B.J.

**2 A DRIVER'S ARM REST** can be made from a piece of sheet iron, some inner tube rubber, and the stuffing from an old seat cushion. Cut and bend the metal to fit the window ledge and your arm. Then cover it with rubber, which should be cemented in place. Before sealing up the end, pack the cushion stuffing inside as padding.—N.L.K.



**3 SHIELDED DECK-LID CORNERS** will help to protect your head should you accidentally bump the corners when the lid is raised. Electrician's rubber tape of the type that is adhesive on one side may be attached inconspicuously to the edges as a safety precaution. It should not interfere with tight closing of the lid.—W.E.B.

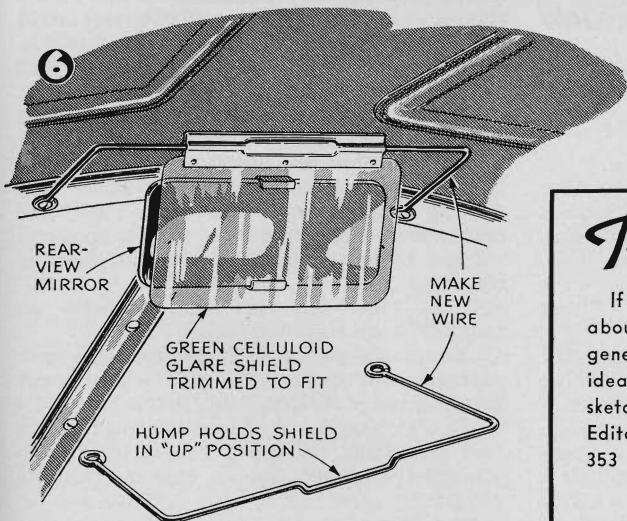
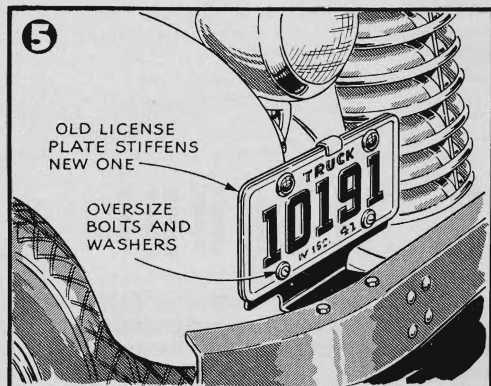
**4 MOUNT AN UMBRELLA** behind the front seat of your car where it is out of the way, yet handy if you are caught in the rain. Sheet steel is usually the material of the seat back, so it will be necessary to drill holes at the proper points and attach the holding straps, as shown, by means of self-threading screws.—H.P.



# FOR CAR OWNERS

**5 LICENSE-PLATE STRENGTHENERS** for heavy trucks on which vibration often tears the sheet metal can be made with—hold your seats—more license plates! Just slap your expired plates against the backs of the new ones, and bolt them in place.—A.H.

**6 TO REDUCE HEADLIGHT GLARE** from your car mirror, replace the wire and rubber cups of a five-and-ten green celluloid shield with a new wire. Bend a hump in the new wire similar to the old one so the shield will snap up or down. With round-nose pliers, loop the ends of the wire to required needs of your car so that the unit can be attached over your mirror using the existing windshield molding screws.—D.C.



**7 DASHBOARD HAND GRIPS** for youngsters who like to stand up in the front compartment of a car make it easier for them to keep their balance as the car rounds corners. Ordinary screen-door handles bolted in place through holes drilled in the top of the dash make a neat job and will withstand much tugging.—I.B.G.



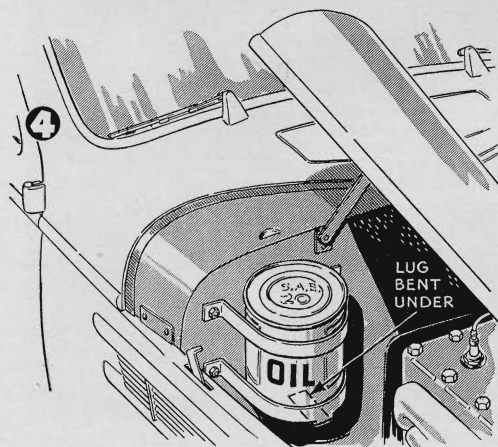
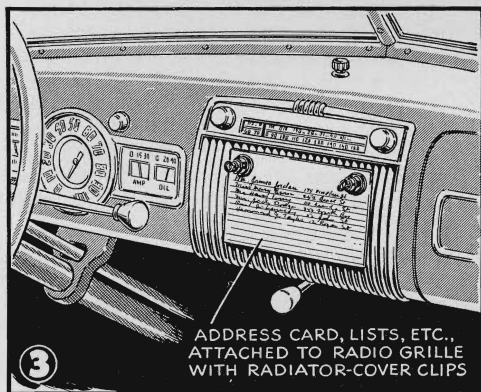
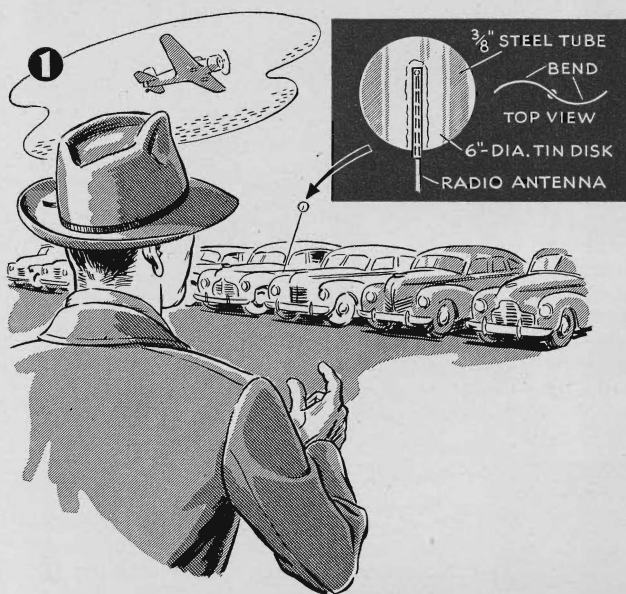
DRAWINGS BY  
STEWART ROUSE

## Think-OF AN IDEA!

If you would like to let others know about your pet auto tip—and get paid generously for doing so—just write your idea in 100 words or less, draw rough sketches, and send them to the Automobile Editor, POPULAR SCIENCE MONTHLY, 353 Fourth Avenue, New York, N. Y.



# IDEAS TO MAKE YOUR



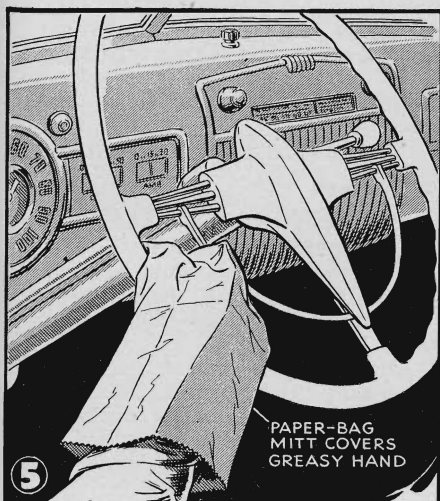
**1 A DISTINCTIVE CAR MARKER** that will instantly identify your parked car no matter how many others are parked in the same lot or field, can be made as shown for attaching to the top of your radio antenna on leaving the car. Because of its reverse curve, a breeze will set it spinning to pick up light reflections at night and make it more noticeable by day.—T. F. S., Jr.

**2 A TUBE OF SHAVING CREAM** of the lather type, carried in the car on trips, frequently will be useful as an emergency soap for washing the hands during stops at service stations where regular soap either is lacking or dirty. Also, the shaving cream itself remains clean in its air-tight container.—W. W. C.

**3 MEMOS, ADDRESSES, AND LISTS** can be kept in plain view of the driver by attaching them to the dashboard radio grille by means of spring clips of the type used to hold radiator covers in place. Simply punch suitable holes in appropriate memo cards and insert the clip hooks through them and into the grille. The clips can be obtained at your auto-accessory store.—H. P.

**4 EXTRA OIL FOR LONG TRIPS** can be conveniently carried under the hood. Make two sheet-metal bands as shown, one having a lug for bottom support. Cut the strips to fit a quart-size or larger sealed can of your favorite engine oil, and bolt the strips to the metal fire wall.—S. R.

# DRIVING PLEASANTER



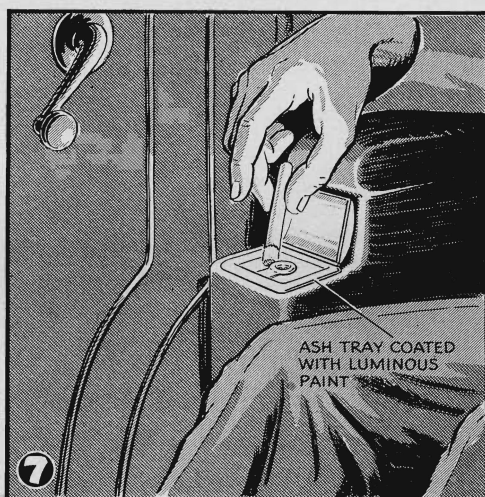
DRAWINGS BY STEWART ROUSE

**5 A STEERING-WHEEL PROTECTOR** for use while you are working on your car and have occasion to turn the wheel with dirty hands is afforded by an ordinary brown paper bag. Put the bag, open, on the front seat before you start work. When you have to touch the wheel, slip your hand into the bag first and use the bag as a glove or mitten.—L. K.

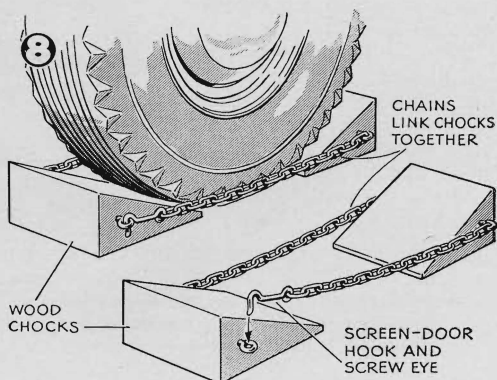
**6 BACK-SEAT SUN VISORS** can be made from the type ordinarily mounted above the windshield of a car by attaching them as shown to the top of the rear door posts. They screen sunlight from either the rear-quarter or rear-door windows, as needed, giving shade where desired to passengers on the rear seat.—B. T.



**7 ASH-TRAY RIMS**, coated with luminous paint of the inexpensive variety obtainable at many hardware and paint stores, are easier for cigarette and cigar smokers to find during night driving. The glowing paint gives off just enough light to reveal the position of the ash-tray opening.—M. W.

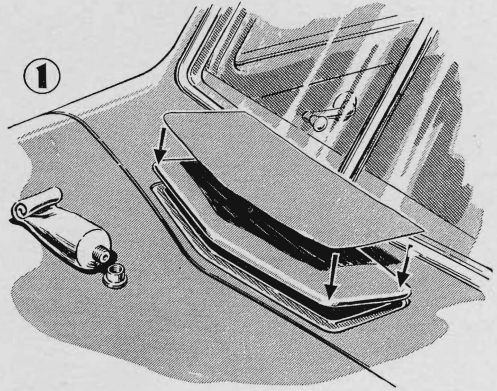


**8 TWIN WHEEL CHOCKS** that are easy to place against a wheel have a novel two-way blocking effect. Made from solid wood, as shown, they are held together by a permanent chain on one side, and an easily disconnected chain on the other. The link is made from a screen-door hook and eye which is closed in a jiffy after the chocks have been put in place for a tire change.—C. E. S.

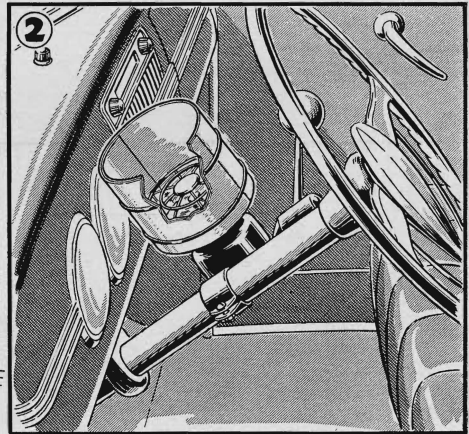


# MOTORING HELPS

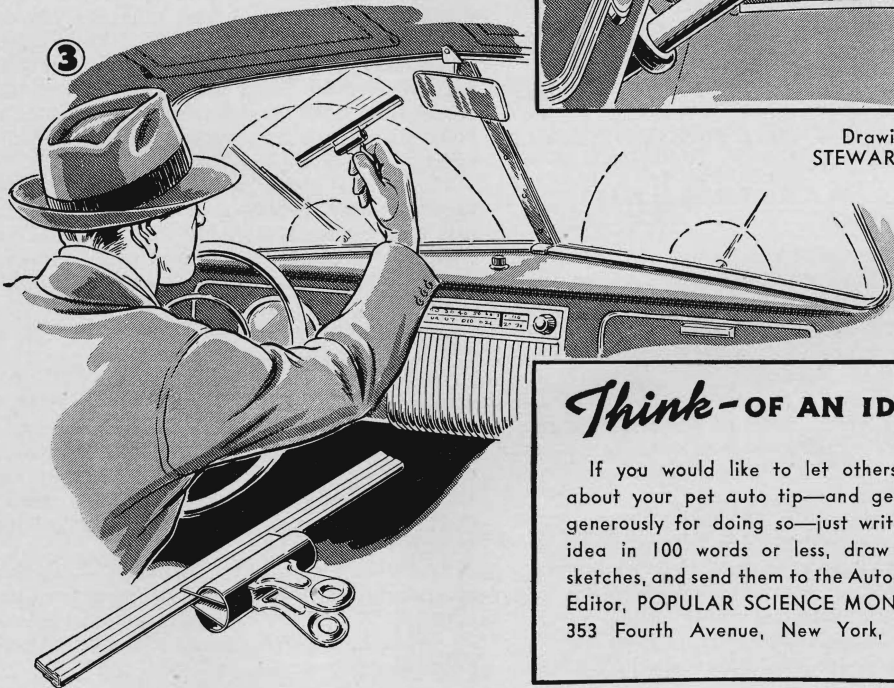
**1 BOTHERSOME GLARE** from cowl ventilators, particularly when they are opened so as to pick up bright light from the sky, can be overcome by applying a nonreflecting shield to the ventilator surface. This may be a piece of window-shade material or other dull fabric, cut to size, and attached to the thoroughly cleaned surface with rubber cement. A flat oil paint may be applied to the material to make it waterproof.—W. E. B.



**2 DEFROSTER FANS** that have wire guards can be made more efficient by attaching a piece of cardboard to the guard as shown in the accompanying drawing. Either elastic bands or pieces of string can be used to hold the cardboard cylinder in place. The resulting tube sends a stronger blast of air to a more concentrated area of the windshield. Laundry cardboard which is fairly flexible forms the best stock.—S. R.



**3 FOR WIPING AWAY MOISTURE** that has condensed on your windshield or side windows and made visibility difficult, a handy squeegee can be improvised from an old windshield-wiper blade. To facilitate using the blade, a jumbo-type, spring paper clip may be attached to its back.—D. B. J.



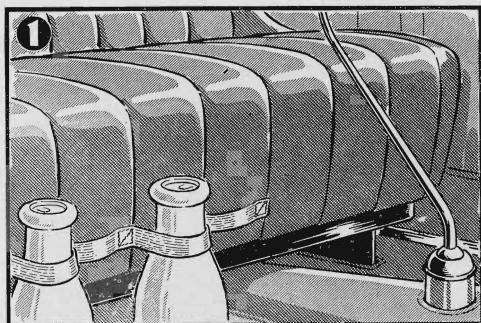
Drawings by  
STEWART ROUSE

## Think-OF AN IDEA!

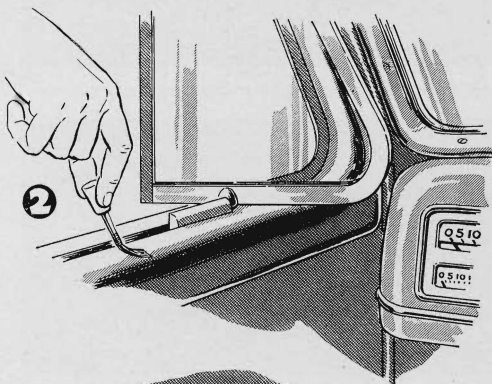
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# EIGHT HANDY IDEAS



**1 BOTTLES WON'T TIP OVER** on the way home from the dairy or store if they are held upright on the floor by the simple expedient illustrated at the left. A strip of elastic tape sewed to the upholstery of the front seat in the manner shown provides loops under which the top of each bottle can be slipped and held securely.—D.S.

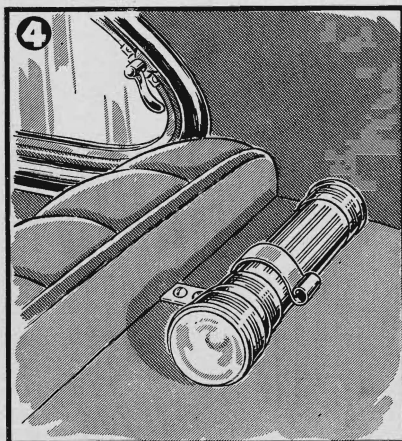
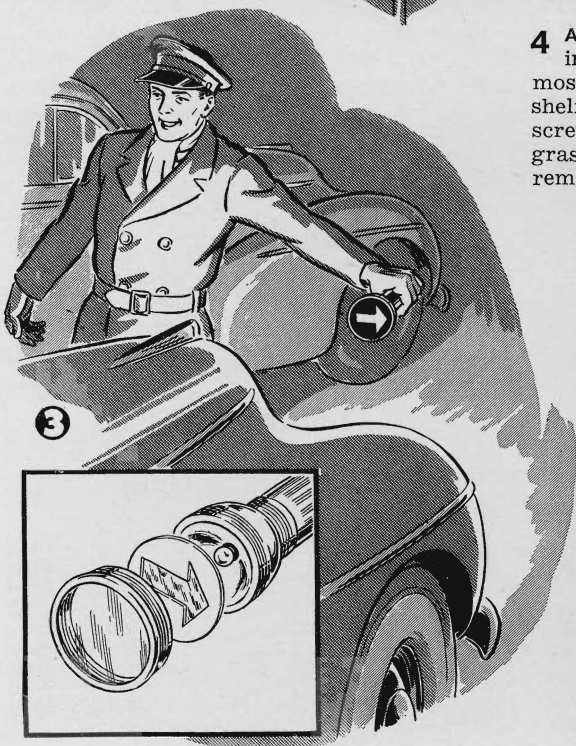


**2 CLEAR NAIL POLISH** brushed over the sill of the door beside the driver's seat will prevent the paint from being worn off by repeated pulling on the sill to close the door, or by the rubbing action of your sleeve if you drive with one arm resting on the sill. The polish will last a long while and scarcely shows if carefully applied.—J.E.R.

**3 FOR DIRECTING CARS** in parking stations, attendants will do well to make this simple flashlight accessory. It consists of a disk of cardboard with an arrow-shaped opening cut out of the center, and a piece of red (or green) transparent cellulose pasted over the opening. Inserted behind the flashlight lens, the disk displays a bright-colored arrow which the attendant can use to direct motorists to make proper turns in crowded parking lots.—H.H.

**4 A HANDY PLACE TO KEEP** an extra flashlight in your car is behind the rear seat where most cars have a wood or composition-board shelf. Make a metal clip or holder and screw or bolt it to the shelf so that it will grasp the light tightly, yet permit its easy removal for use.—A.R.

DRAWINGS BY  
STEWART ROUSE





# TO HELP MOTORISTS



5

TRUNK  
FLOOR  
MAT

**5 A HANDY KNEELING PAD** for changing tires is convenient to most motorists without their realizing it. It consists of the rubber mat on the floor of the luggage compartment. Easily slipped out and spread on the ground beside a wheel, it can be brushed clean after use with much less trouble than is required to clean your clothes.—J. V.

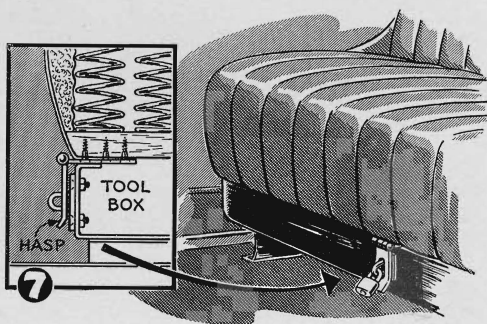
**6 WITH A DOME LIGHT** installed as shown in the right-hand sun visor, front-seat passengers have a highly useful source of illumination. Inexpensive units can be obtained from junked cars, and installation will depend upon the design. Besides serving as an over-all light source for the front compartment, the light makes an excellent reading lamp when the visor is turned down and to one side.—M. M.

**7 A HASP AND PADLOCK** will keep the front seat of a car from being raised, thus preventing theft of valuable tools. Since front seats usually are held down at the back by the back of the seat, only the front need be secured. Either nuts and bolts or strong wood screws should be used, depending on whether fastened to steel or wood—H. W. S.

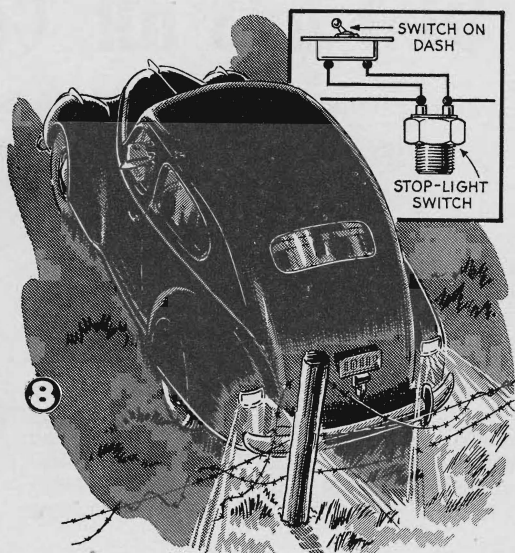
**8 BACKING LIGHTS**, using the relatively strong light of your stop lights, can be improvised in the manner illustrated. Carefully connect the terminals of the stop-light switch with wires leading to a switch placed conveniently on the dashboard—D. B.



6

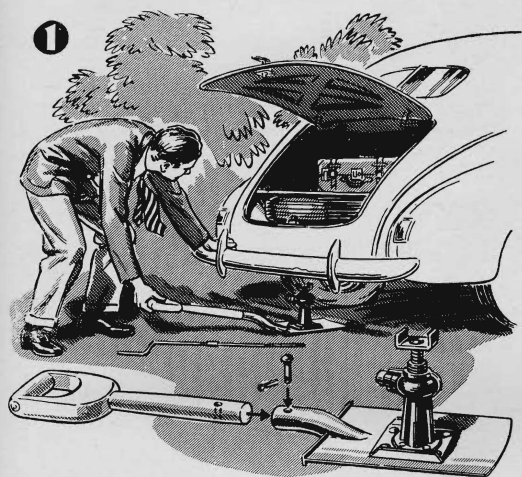


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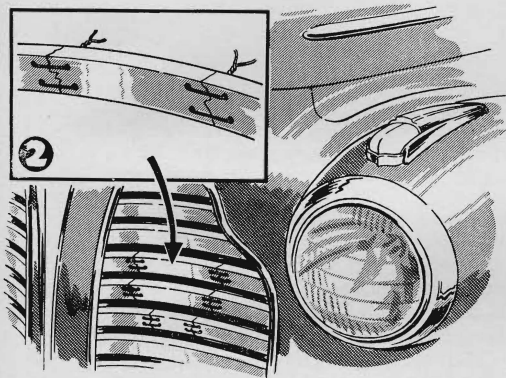


8

# HINTS FOR MOTORISTS



**1 A FIRM BASE FOR A CAR JACK** is provided by an old spade, made so that it comes apart, as shown. The two parts will take up little room in the luggage compartment or under the front seat. When assembled, they form a platform and handle for sliding the jack in place under the car. The broad shovel blade supports the car weight on soft ground, while it may also be useful for digging a stuck wheel from the mud.—A. H. W.

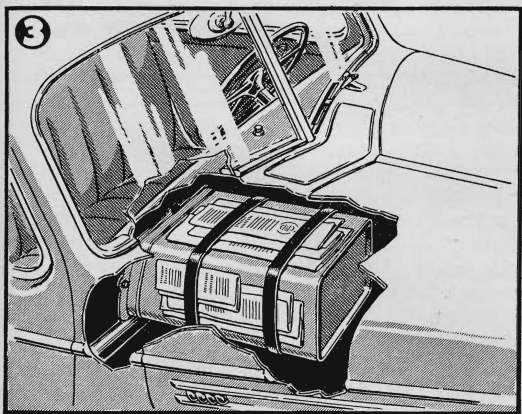


**2 RADIATOR GRILLE BARS** of the cast-metal type can frequently be repaired by drilling small holes near the breaks and wiring the pieces back in place with soft iron wire. Touching up with aluminum or silver paint makes the job neater.—V. P.

**3 LICENSES, ROAD MAPS,** and other papers that clutter up a glove compartment but which belong permanently in your car, are out of the way yet readily available if stuck under rubber bands snapped around the compartment itself, as shown in the accompanying sketch. If heavy bands are not available, cut a pair from an old inner tube.—R. N.

**4 A BRIEF-CASE HOLDER** attached right to the door of the car beside the driver's seat is particularly convenient for traveling business men. It keeps the case upright and off the seat or floor, and always at hand when stops are made. It is easily bent from iron wire with the aid of a vise, hammer, and pliers. Short, self-threading screws fasten it to the door panel.—E. F. G.

DRAWINGS BY STEWART ROUSE



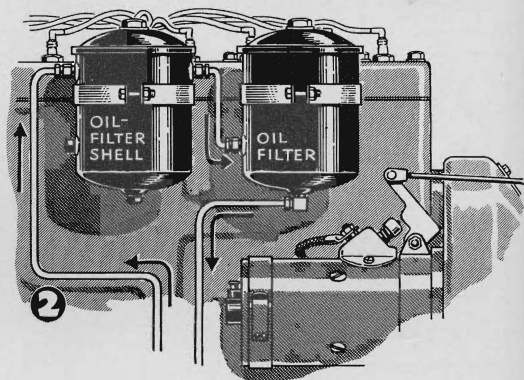
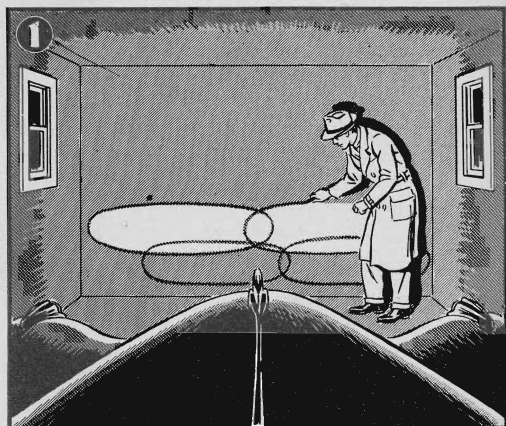
# EIGHT THINGS TO DO

**1 HEADLIGHT-BEAM GUIDE LINES** drawn on the wall of your garage with the car centered and backed away a few feet will facilitate adjustments and permit frequent check-ups on the angles of the traffic and country beams. Additional marks painted on the floor beside one front and one rear wheel will help you place the car exactly where it was when the light-guide lines were made.—D.F.

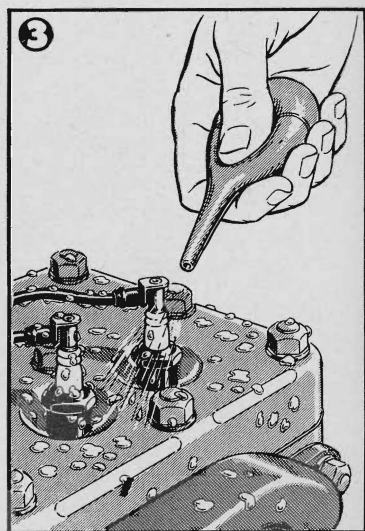
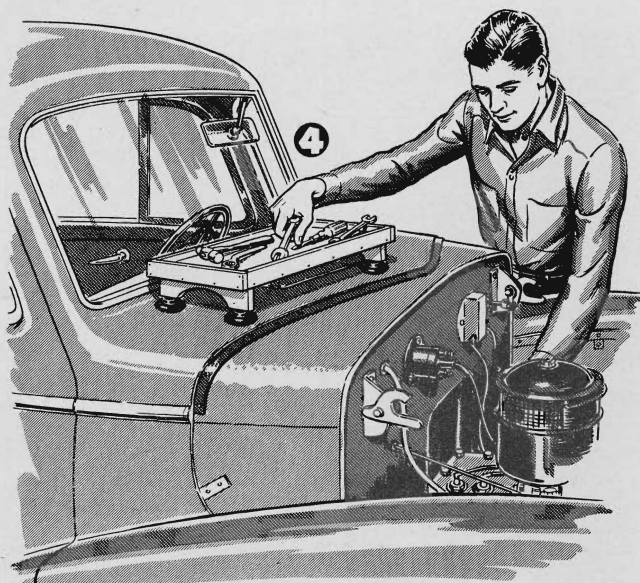
**2 AN OIL-FILTER SHELL** of the replaceable-cartridge type, connected as shown into the intake line of your existing filter, makes an effective sediment trap. Remove the cartridge from the filter shell to be added and mount the shell securely on the motor block. Use care in loosening couplings as they are easily damaged.—M.H.

**3 DRYING SPARK PLUGS** after a car has been left in the rain is sometimes a difficult chore. A rubber ear syringe of the type illustrated reaches to the bottom of each spark-plug recess to suck up most of the water, after which a few puffs from the tip will remove remaining moisture.—F.K.

**4 A TOOL TRAY** to keep tools handy while you are working on a car motor can be made from a plywood or other thin board, with four vacuum cups attached to short legs at the corners and low sides to keep articles from rolling off. The rubber feet will not mar a car's finish, while the vacuum cups prevent the tray from slipping.—L.K.

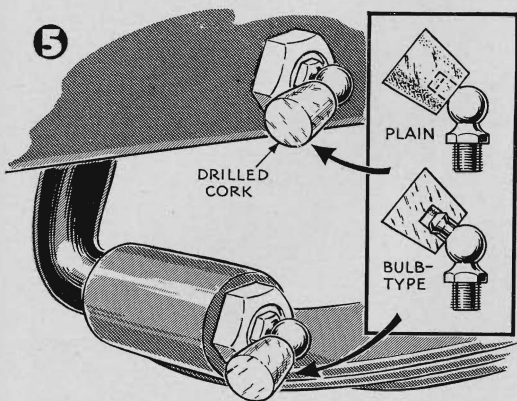


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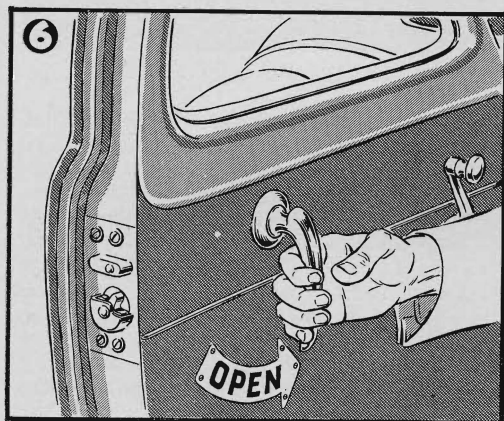




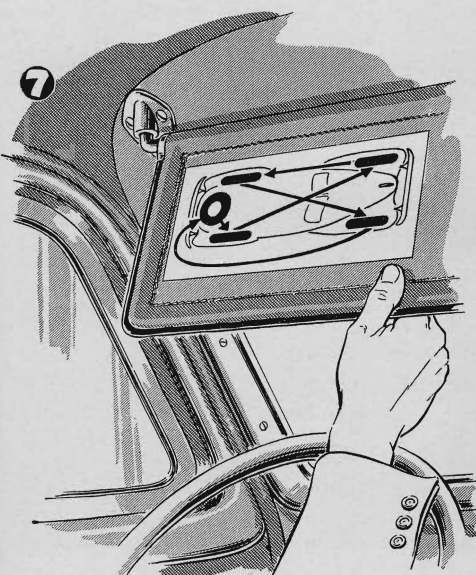
# TO IMPROVE YOUR CAR



**5 DUST CAPS** that will keep the open ends of chassis grease fittings clean can be made with medicine-bottle corks. Drill holes, slightly undersize, partly through the corks and force the corks over the fitting nipples. When removed, they leave the fittings clean instead of covered with a layer of greasy dirt which would be forced into the bearings by a grease gun.—A.G.C.

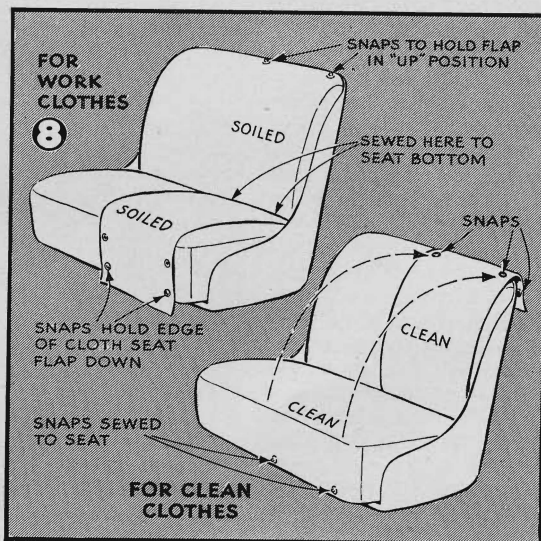


**6 ARROWS MARKED 'OPEN'**, properly placed beneath the inside door handles of a sedan, will quickly indicate to puzzled passengers the answer to their usual dilemma as to which way to turn the handles to open the car doors. If cut from sheet metal for durability, the markers' edges should be carefully rounded with a file. Good glue or self-threading screws hold them in place.—T.F.



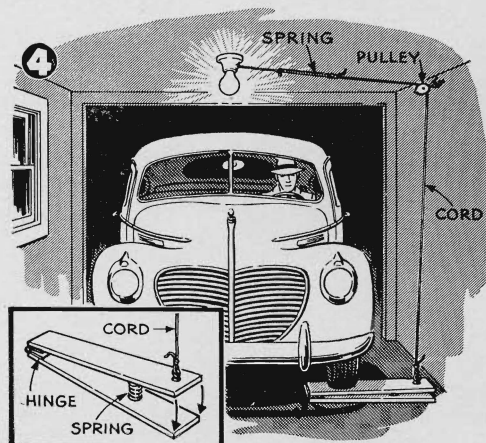
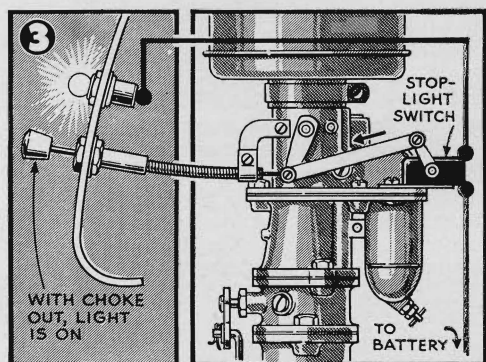
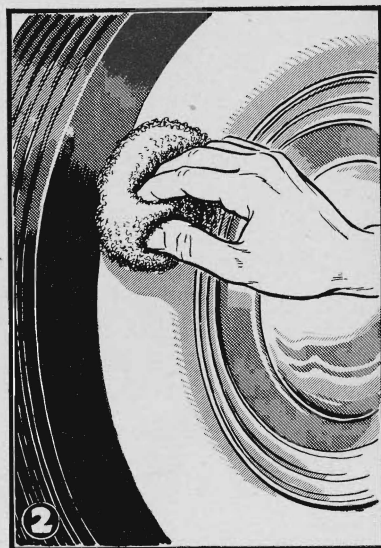
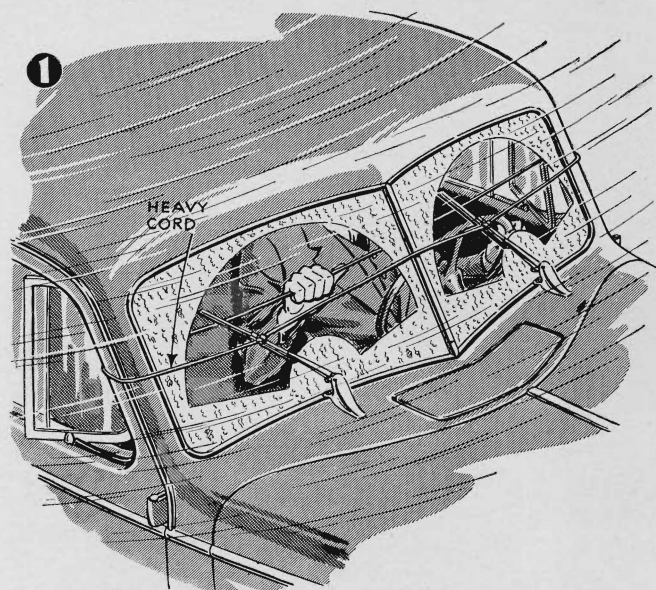
**7 A TIRE-CHANGE REMINDER**, to tell you when to shift tires around for equal wear, can be fastened to a sun visor. Cover a small diagram (see P. S. M., Feb. '42, p. 133) with transparent celluloid. Sand a strip at the bottom for writing in the mileage, and cement the unit to the visor.—T.T.

**8 AN UPHOLSTERY-MATCHING FLAP**, sewed as shown to the driver's seat, keeps the seat clean. When driving in work clothes, the driver sits on the flap. At other times, the flap is fastened up against the seat back with properly placed snap buttons, thus hiding any marks left on the material.—R.A.





# EIGHT USEFUL IDEAS



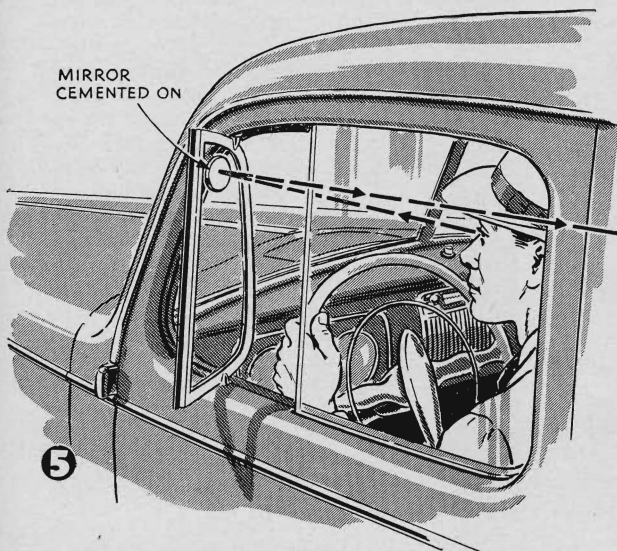
**1 WINDSHIELD WIPERS** that fail may be operated in emergencies with the rig shown. Simply loop a heavy cord through the door windows entirely around the shield. If the wipers are mechanically coupled to work together, only one wiper blade should be tied to the cord. Leaving the front windows slightly open, you can operate the blades by hand from inside the car.—J.R.

**2 STEEL-WOOL SCOURING PADS** of the kitchen variety, impregnated with soap, are excellent for cleaning white-sidewall tires. Wet the tire and pad and rub the walls gently. Too-energetic treatment should be avoided, and the tires should be thoroughly rinsed with water to remove the soapsuds.—V.S.

**3 A CHOKE-BUTTON WARNING LIGHT** that gleams on your dashboard whenever the choke button is out will help prevent wasting gas. Mount a stop-light switch on or near your carburetor, coupled to the choke lever as shown, and wired with a good-quality insulated wire. Various types of stop-light switches and warning-light sockets are obtainable at auto-accessory stores.—W.P.

**4 AUTOMATICALLY LIGHTING YOUR GARAGE** as you drive in, the treadle switch shown is easily made from two hinged boards, two coil springs, and string. Set the switch well inside the garage so that only the front car wheels pass over it. Before backing out, light the light by hand or foot.—J.C.J.

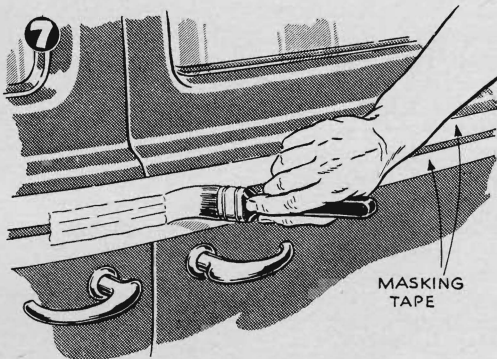
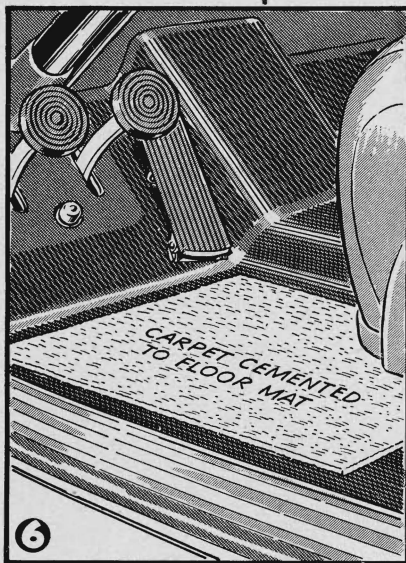
# FOR THE CAR OWNER



DRAWINGS BY STEWART ROUSE

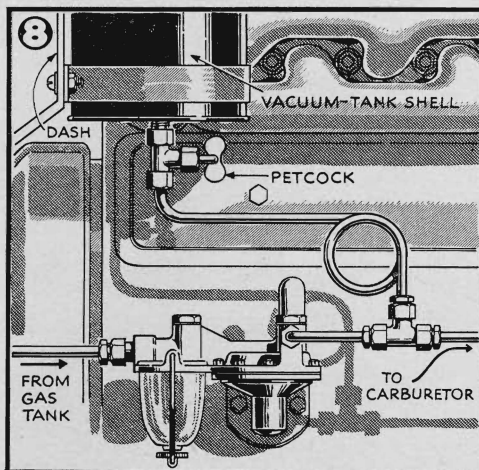
**5** A REAR-VIEW MIRROR that can be aimed through a wide angle without putting your hand outside the car is afforded by cementing a small pocket-size mirror to the ventilator window at the left of the driver's seat. Set at eye level, it is turned by moving the window in or out. A good china-mending cement will hold it tight.—V.L.

**6** TO LENGTHEN THE LIFE of rubber floor mats, or to cover up worn spots, a piece cut from an old carpet to the desired size and shape makes a soft, easily cleaned cover for the car floor. Wash the rubber mat clean before attaching the carpet by means of household rubber cement.—H.J.S.



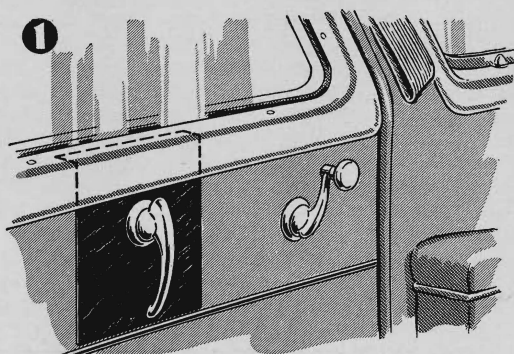
**7** REPAINTING THE STRIPES on your car is greatly simplified by the use of painters' or artists' masking tape. Available with an adhesive back at most hardware stores, the tape is placed on each side of the area to be refinished. Paint the area, letting some paint get on the tape, and remove the tape before the paint is fully dry.—J.R.R.

**8** A RESERVE GAS TANK made from an old-fashioned vacuum tank can easily be attached to the cowl under your engine hood. The supply tube, with a good-size loop to allow for vibration, should be connected to the carburetor side of the fuel-pump line. The tank should be above the float level of your carburetor, and equipped with a petcock for controlling the flow.—E.G.G.

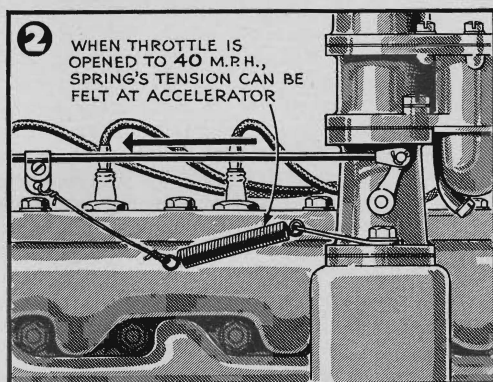


# USEFUL AUTO HINTS

**1 NEAT REPAIRS** to the fabric finish of doors, which usually become worn around the inside handles, giving a shabby appearance to the car interior, can be made by removing the handles and gluing squares of artificial leather over the worn portion of the panel. The top should run up under the window molding, and identical patches on each door give a tailored effect.—R.W.K.

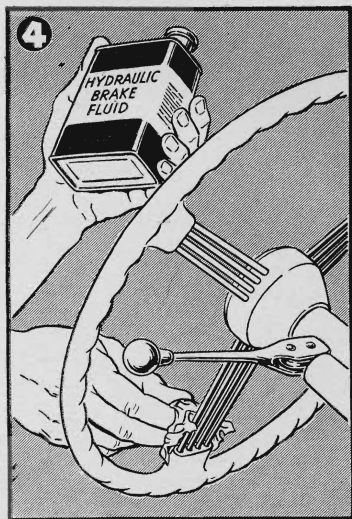


**2 SPRING TENSION**, which can be felt at the foot accelerator when your car reaches 40 miles an hour, will help you keep your speed down to an economical level. The spring is loosely connected as shown, and adjusted by experiment to take effect when car speed reaches 40. It will not hamper the use of full throttle on hills.—H.F.H.



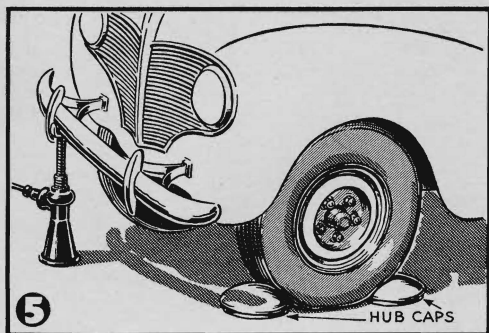
**3 TIRES STUCK TO RIMS** can often be freed with little effort by the simple expedient of placing the wheel on the ground under a bumper and using the car jack to force the bead from the rim. Center the jack under the bumper to take advantage of as much car weight as possible.—J.P.L.P.

**4 SQUEAKY STEERING-WHEEL SPOKES** are a distracting annoyance and sometimes difficult to get rid of. An unusually effective remedy is obtained by rubbing hydraulic-brake fluid on the junction of the spokes and the plastic wheel itself, both at the hub and the rim. Wipe the fluid off again with a clean cloth.—J.R.

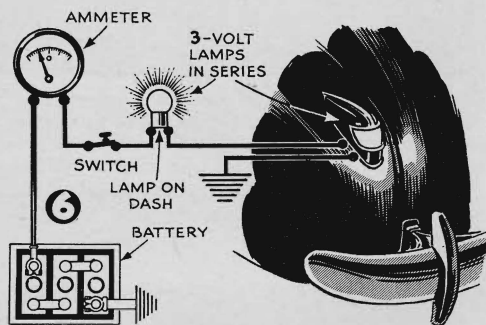




# FOR BETTER MOTORING

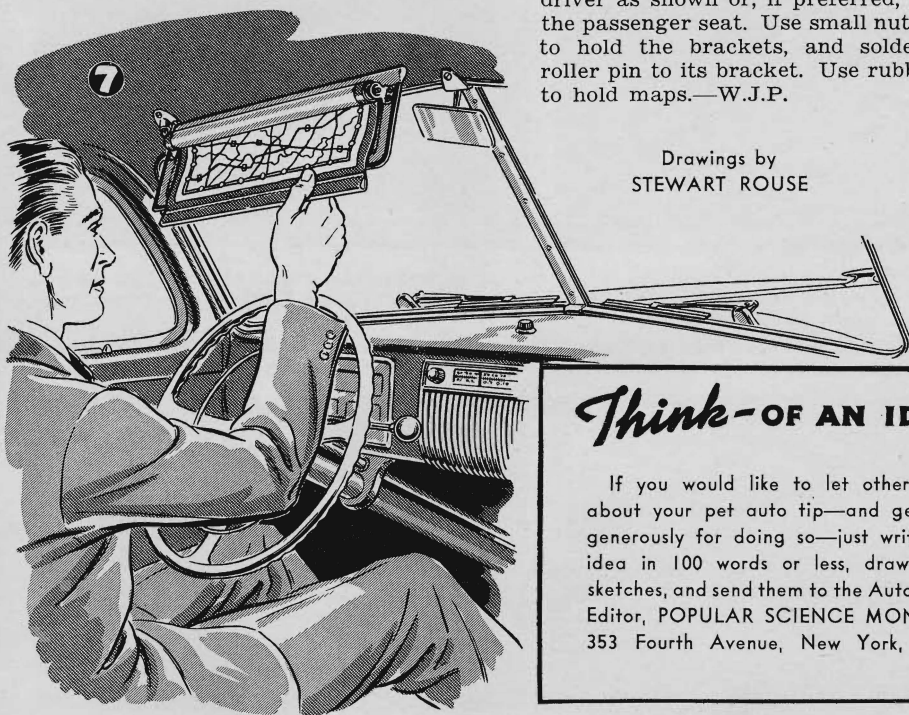


**5 WHEEL BLOCKS** to prevent the car from rolling backward or forward off its jack while a tire is being changed are handy to most motorists without their realizing it. Such blocks are afforded by the removable hub caps which the majority of cars have. Use one from the wheel that is to be changed and which must be removed anyway. Take the other from the opposite wheel. One before and one behind this wheel will prevent the car from rolling in either direction.—L.R.



**6 A NOVEL WARNING LIGHT** that tells a motorist if his tail light burns out can be rigged up with little trouble. Mount a small colored lens in your dashboard. Behind this install a lamp socket. Connect the socket in series in the tail-light circuit. Obtain two three-volt bulbs, fitting one into the dash socket, the other into the tail light replacing the six-volt bulb. If the car has twin tail lights, a second, substitute circuit with its own pilot lamp must be run from the switch to the second tail light.—H.L.A.

**7 A HANDY ROAD-MAP HOLDER** for drivers keeps its map ready for study. It consists of a cut-down window shade and roller mounted on conventional roller brackets attached to the sun visor either in front of the driver as shown or, if preferred, in front of the passenger seat. Use small nuts and bolts to hold the brackets, and solder the flat roller pin to its bracket. Use rubber cement to hold maps.—W.J.P.



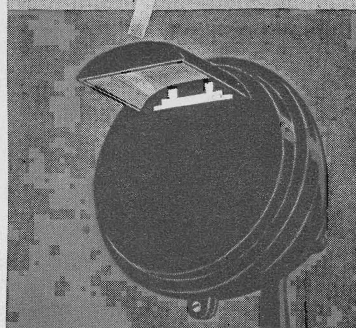
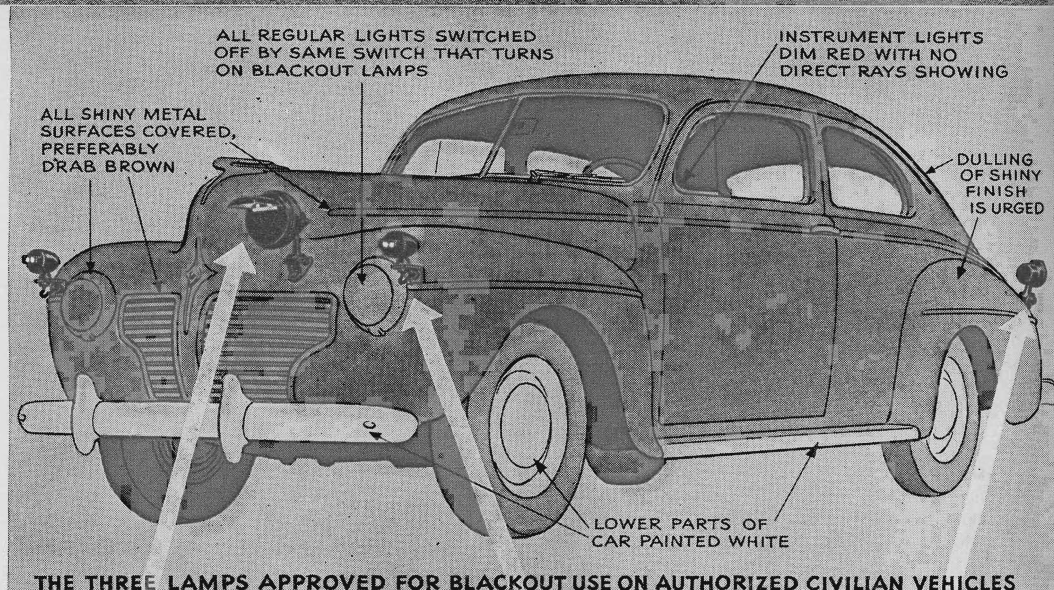
Drawings by  
STEWART ROUSE

## Think-OF AN IDEA!

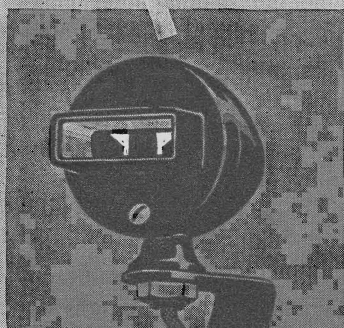
If you would like to let others know about your pet auto tip—and get paid generously for doing so—just write your idea in 100 words or less, draw rough sketches, and send them to the Automobile Editor, POPULAR SCIENCE MONTHLY, 353 Fourth Avenue, New York, N. Y.



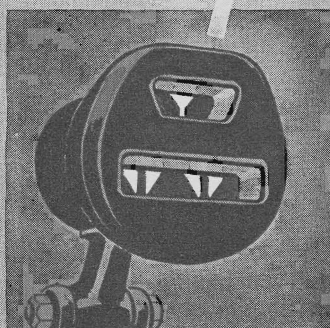
# Blackout Road Rules



**DRIVING LAMP.** One at front between center and side of car



**CLEARANCE LAMP.** One at each side of front of vehicle



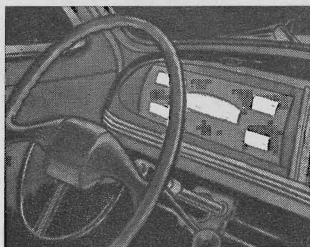
**TAIL AND STOP LIGHT.** One; two if vehicle is 80" or wider

**I**F YOU are authorized to drive during a blackout from now on, your vehicle must carry the special new blackout lights just approved by the War Department. The lights consist of a driving lamp and two clearance lamps for the front, and a combination tail and stop light for the rear of each motor vehicle. If you ride a bike, push a cart, or drive a horse, required equipment is specified for them, too. And every authorized vehicle must be prepared in advance so that its bright metal work is dulled, shiny surfaces covered, and, in some cases, it is equipped with approved reflector elements properly attached.

A recent War Department specification tells how the lights and permissible

marking devices must be mounted on private and commercial cars, trucks, bicycles, pushcarts, ambulances, horse-drawn vehicles, and practically everything on wheels. And it warns frankly what the well-dressed pedestrian should wear when, and only when, duty or necessity compels him to venture abroad during a blackout.

Pictures and many details of the three new approved lights are being withheld by the War Department as capable of giving aid to the enemy. But permission was given to **POPULAR SCIENCE** to show, in the illustrations above, its conception of them, as



**DASH LIGHTS** must be dim red or out; automatic lights inoperative with blackout lights on

# WAR DEPARTMENT SPECIFICATIONS TELL WHAT LIGHTS TO USE; HOW AND WHEN TO USE THEM

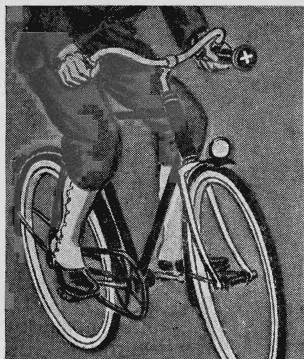
drawn by its own artist from information that has been released.

You probably won't be able to buy the lamps for some time, since the output of several manufacturers is going to the Government. Until then, there are no other officially approved blackout driving lights. Co-operating with the War Department in drawing up the specifications were the Army Engineer Board, the National Technological Civil Protection Committee, the National Defense Research Council, the U. S. Bureau of Standards, the Interstate Commerce Commission, the Office of Defense Transportation, and the War Production Board.

The main driving light has a hood projecting out over its large black mask. A lens fitted under the hood forms a horizontal light slot, flat on the bottom but with several short vertically extending slots along its upper edge. The hood permits from 25 to 50 candlepower to be projected on the road, but cuts this value to .005 candlepower one degree above the horizontal—virtually invisible from a few yards away. A pair of standard sealed-beam headlights throw 50,000 candlepower on the road.

It is for use on all motor-driven vehicles, including streetcars, busses, trolley-busses, and motorcycles. On all but the last it is mounted between the left side and center. Motorcycles carry it center-mounted. It must be far enough forward to eliminate objectionable reflection from the vehicle itself, as near as possible to the normal line of the operator's vision, and between 36 and 55 inches above the road in a normally loaded vehicle, but no higher than the top of the steering wheel.

Mounting calls for critical adjustment so that the slot is level and the beam projects straight forward.



**BICYCLE.** Amber reflector at front; red, rear. Whiten lower parts. Blackout flash is urged

The visual cutoff of the top of the beam on a vertical screen 10 feet in front of the lens must be between two and three inches below the bottom of the slot.

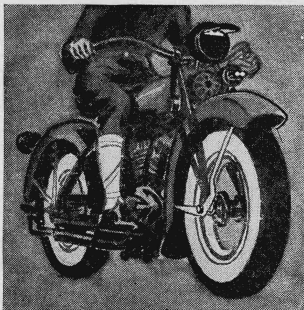
The clearance lamps—a pair to each motor vehicle except motorcycles, which have one—show white for emergency vehicles only, amber for all others. Smaller than the driving light, they are securely mounted as near to the sides of the front of the vehicles and as close to the headlight level as possible, without interfering with the function of the headlight. Aimed straight ahead with the face of the lens vertical and the slot horizontal, the lamps shine with the driving light to show the width of a vehicle. Motorcycles use just one clearance lamp at the front center.

Casting no usable light on the pavement,

the clearance light has a rectangular hood with a lens over the front end and a light-absorbing inner surface. The hood, about an inch long, carries a light mark at its back consisting of two more-or-less triangular lenses with the apex of each triangle pointed down. Thus they appear brightest from straight ahead, the brightness diminishing to zero as the viewing angle rises. They can be seen from about 1,000 feet dead ahead.

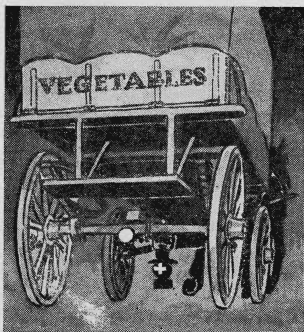
The approved combination tail and stop light is to be mounted close to the left rear of the vehicle. Its red tail-light lens goes at the bottom, its amber stop-light lens at top. The light openings are recessed in the housing. Recessing gives the same effect as a rectangular hood.

The masked opening of the tail-light unit takes the approximate shape of four V's lined up beside each other, with a wide space between the two center ones giving the appearance of two separated pairs of V's to the lineup. From some



**MOTORCYCLE.** Driving and one clearance lamp front; tail-stop rear. Dull all shiny areas

**ANIMALS.** Use blackout flash or lantern to reveal them. Reflectorize wagons same as bikes

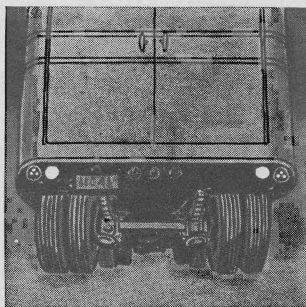


distance away, the four V's blend to the eye so that they appear as a single red glow. Closer, the outside pairs of V's appear as two distinct glow spots. Still closer, all four V's appear distinctly in their separate positions. Thus the tail-light lens is at once a warning of the presence of the vehicle and a gauge of its distance from the observer.

The clearance lights forward display a similar, though modified, distance-gauging effect with their two small openings. It is of less importance, however, since the two lamps themselves furnish the eye, accustomed to judging perspective, with ample distance information.

The War Department says that the blackout lights must have their own separately fused wiring systems controlled from a combination master switch that turns off all regular lights when the blackout lights are turned on. It must also turn out both sets of lights in its "off" position. Instrument lights are an exception. They may remain lighted if they provide only dim, red, indirect illumination, though you will see better by putting them out. Directional signal lights, normal stop lights, and others that are manually operated must be made inoperative and never used during blackouts.

Vehicles 80 inches or more wide must carry extra combination tail and stop lights on the extreme right rear, balancing the left rear ones. Also, two approved red reflectors must be attached no higher than 30 inches on the extreme rear near the sides, as well as two amber ones at front near the sides. If over 35 feet long, a vehicle must also display low-mounted red reflectors on the sides near the rear, and amber ones on the sides near the middle and the front. Such side and rear reflectors are strongly recommended for all vehicles, as is flat-white or reflectorized paint on bumpers, hub caps, and lower portions of all vehicles. All shiny sur-



**WIDE MOTOR VEHICLES.** Extra tail-stop lamp plus special reflectors at sides, rear, front

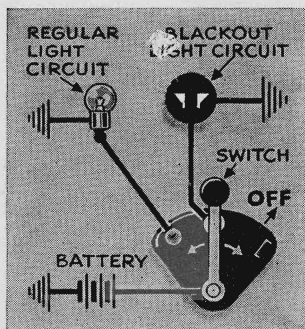
faces should be dulled, preferably with drab-brown paint.

Streetcars and busses of all descriptions must carry approved driving, clearance, and tail-stop lights and specified reflector elements. Bicycles, the lowly pushcart, and other human-powered vehicles must have approved amber reflectors on the front and red ones on the rear, and white paint on lower portions is urged. Approved blackout flashlights and lanterns—not yet announced as this issue goes to press—may supplement or substitute for the reflectors. Animal-drawn vehicles—even ridden or herded animals—must stay off highways unless protected with blackout flashlights or lanterns, displayed so the animals are visible to approaching traffic.

The special reflectors for use on the sides and ends of vehicles during blackouts are far different from plain colored reflectors and mirrors. Place two glass mirrors at right angles to each other and you can then see your own reflection in them from a wide, horizontal viewing angle. The blackout reflectors use this principle, but add an extra mirror for three-dimensional viewing. Thus, light striking them is reflected straight back to the source, but in no other direction. As a result, your own car's lights will pick out a reflectorized vehicle, but not reveal that vehicle to anyone else.

Individuals must stay off streets during blackouts. Necessity or official duty is their out. Then, they should wear white or reflectorized leggings, or anklets equipped with approved clear reflectors, and should carry a blackout flashlight or lantern. In lieu of leggings or anklets, white cloth should be wrapped around the lower legs. Finally, pedestrians should remember that under blackout conditions "they generally are not visible from moving vehicles." That's fair warning.

—SCHUYLER VAN DUYNE.



**SWITCH** puts out normal lamps as it turns on blackout lamps. Also puts out everything

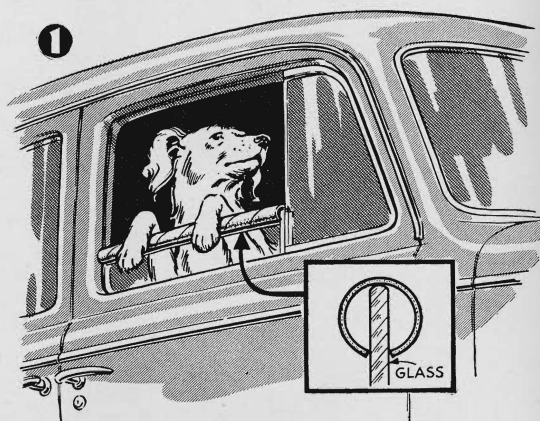
**PEDESTRIAN.** Must wear white or reflectorized leggings; should carry approved flash or lantern



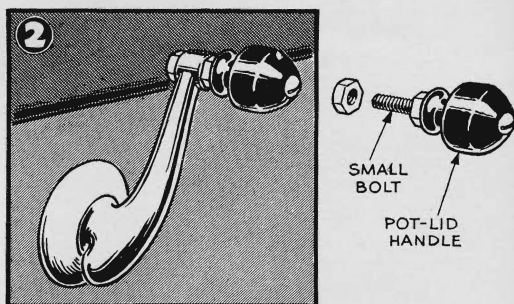


# PRACTICAL HINTS

**1 LEG PADS FOR POOCHES** that like to ride with their forepaws on the window ledge of the car door will make a dog's life pleasanter and also protect the car finish. Slit a length of 1" mailing tube and place it over the glass as shown. Raise the window slightly above the sill so the dog's toe nails will not contact the paint.—J.R.

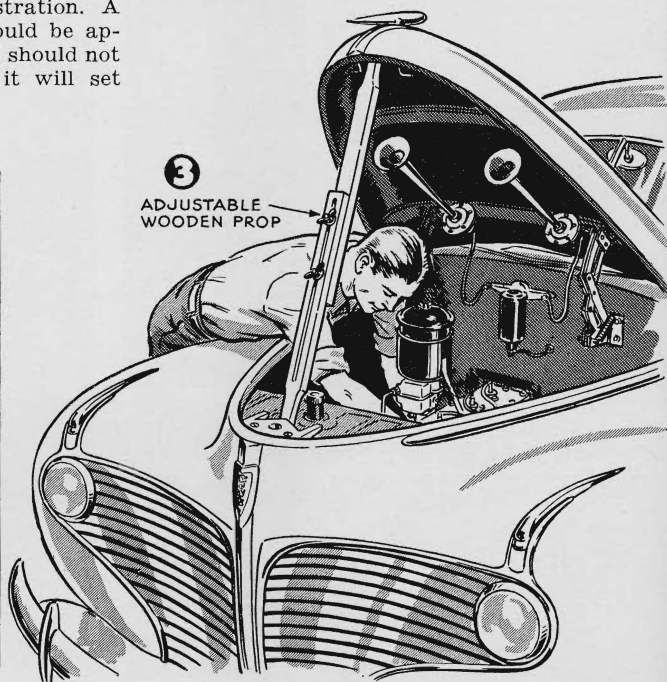
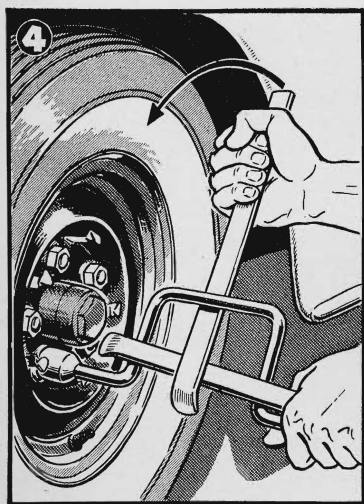


**2 NEW WINDOW-CRANK KNOBS** to replace those worn or broken off can be improvised from five-and-dime store pot-lid knobs. Remove the new bolt and replace it with a longer one on which two nuts are screwed. Insert the bolt with the knob in the hole that formerly held the pin, and tighten the nuts against the crank.—J.C.



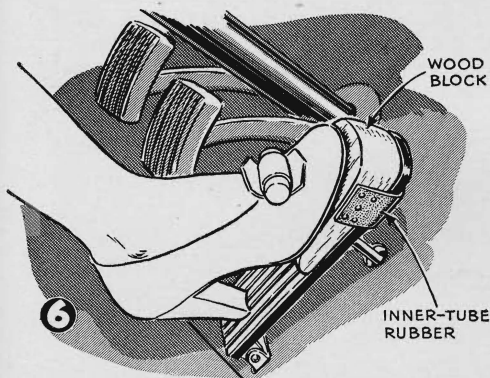
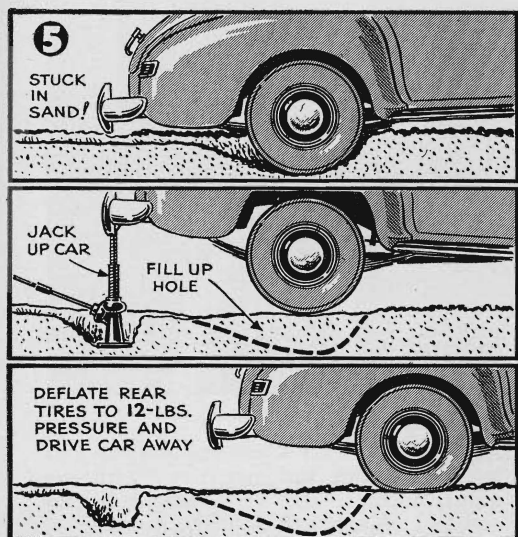
**3 TO PROTECT YOU** against getting bitten by the jaws of your alligator-type engine hood, an adjustable safety prop can be easily made from light lumber. Two pieces of 1" by 2" by 26" wood, one of them slotted part of its length, the other having two wing nuts and bolts with washers, are all the material needed. It is easily adjusted and fits all makes of cars.—L.M.

**4 STUCK WHEEL LUGS** which have been tightened too much or have rusted in place can be given an extra boost to loosen them with a pair of tire irons crossed against the lug wrench as shown in the illustration. A few drops of penetrating oil should be applied to the lug first. The method should not be used in tightening lugs, as it will set them tighter than needed.—A.R.





# FOR CAR OWNERS



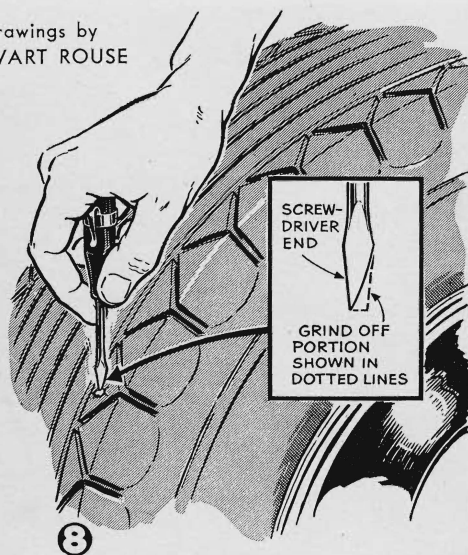
**5** A CAR WHEEL STUCK IN SAND is freed easily with the technique illustrated at the left. Dig a small hole for the bumper jack and raise the wheel as far as possible. Then shovel or kick as much sand under the wheel as you can, packing it in. Deflate the tire to around 12 or 14 pounds. Remove the jack and you will be able to drive the car away under its own power.—J.D.

**6** WITH A TOE REST slipped over the accelerator-pedal tip, women wearing high-heel shoes will find car driving much easier. Cut from a block of wood to a comfortable size, and held in place by a strip of rubber or leather, the toe rest raises the instep and relieves the ankle of strain.—A.H.W.

**7** MANY MOTORISTS PREFER not to use their rear-view mirrors at night. An ingenious, glareless substitute is afforded by small colored reflector buttons cemented to the center strip of a divided windshield. Car lights from far behind strike all the buttons; close behind, they strike only the top ones, thus indicating their distance to the driver. Remove the bolts from five-and-dime-store buttons, apply mending cement, let it dry, then reapply cement and attach the buttons, for a firm hold.—R.P.

**8** A HANDY TOOL for digging bits of glass, sharp stones, and the like from tire treads is made by grinding away a portion of the blade of a pocket screwdriver, as illustrated below.—W.E.B.

Drawings by  
STEWART ROUSE

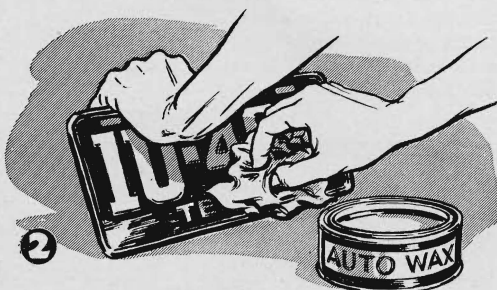




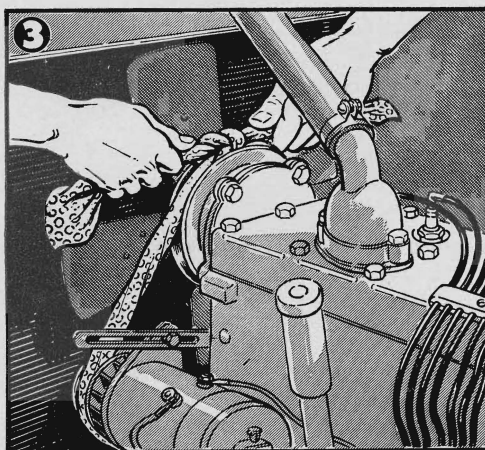
# IDEAS FOR MOTORISTS

**1 PROTECTIVE INSULATION** for the hood of a car is provided by applying one or two coats of aluminum paint to the underside, as illustrated above. The paint, which can be obtained from most hardware stores, slows the progress of the engine heat upward, thus lengthening the life of the paint or enamel finish at the point where it usually deteriorates first and fastest on an aging automobile.—G.W.P.

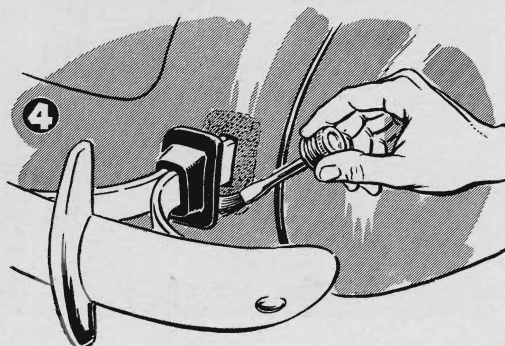
**2 YOUR LICENSE PLATES**, formerly finished for an expected life of no more than a year, may need extra care to keep them in condition for several years of use under the war-time metal-conservation program adopted by most states. An occasional thorough waxing with automobile wax will help keep them in good condition.—D.B.J.



**3 AN EMERGENCY FAN BELT** that will get you considerable distance to a garage if you are caught with a broken belt and no spare can be contrived from a necktie. Pull the ends fairly tight and secure them with a square knot. Don't race your engine and don't drive your car more than 10 or 15 miles an hour.—B.H.



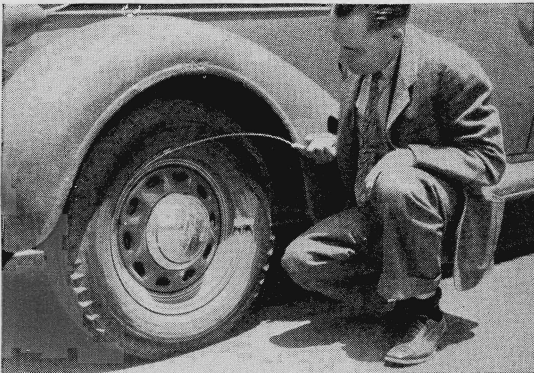
**4 LOOSENED RUBBER PADS** on bumper arms, lamp brackets, and the like, should be tightened promptly. To do this, clean the surfaces with gasoline, let them dry, and apply running-board cement to both surfaces. Clamp solidly until dry.—J.N.



DRAWINGS BY STEWART ROUSE

# Auto Ideas

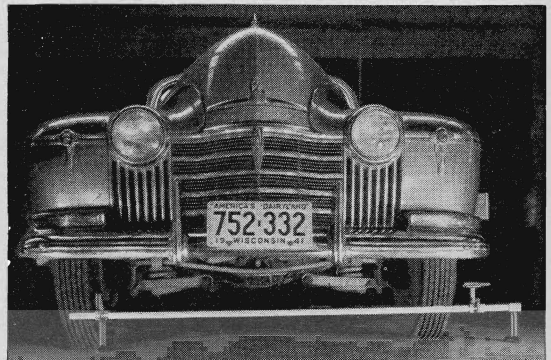
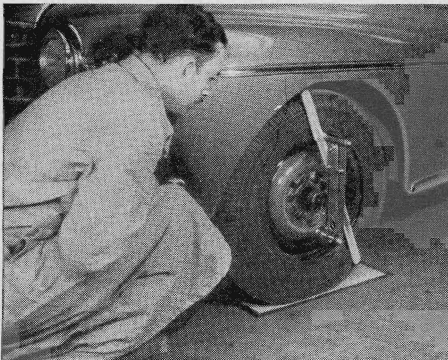
**PAINTING MILES ON TIRES** is now possible with a new type of liquid made from synthetic rubber that is simply put on with a brush. Any number of coats may be applied, each after the previous coat has dried. As shown in the illustration at the right, the substance is applied directly to the tread of a tire to build up a new traction surface. The dried material resembles rubber, and is said to add many miles of wear to the life of a tire.



**FLAT-TIRE WARNING** is given to the driver of a car equipped with the novel invention of a Mayville, N. D., motorist. The device consists of a length of wire locked to the wheel by a special lock. When the tire becomes deflated beyond a predetermined point, the lock springs open, releasing one end of the wire. Thus loosened, the wire leaves the rim and the revolving wheel causes it to bang against the fender or fender well of the car in unmistakable warning that the air pressure in the tire is getting low. How the gadget is mounted on the rim of a car wheel is illustrated at the left.

**A PORTABLE WHEEL ALIGNER** just introduced is particularly useful in small shops where floor space is at a premium. The unit, which any mechanic can use, checks camber, caster, and toe-in. The protractors that show camber and caster (left, below) are quickly fastened to the wheels by small

clamps. The toe-in trammel bar (right) is of direct-reading type and is adjustable to different wheel treads. An angle gauge which is used with the trammel bar sets the wheels at the correct angle for properly reading steering geometry angles, and the whole unit takes up little storage space.

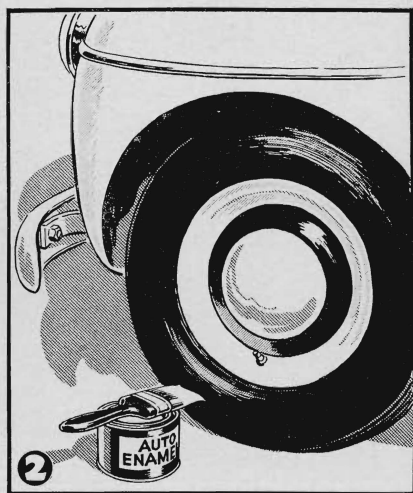




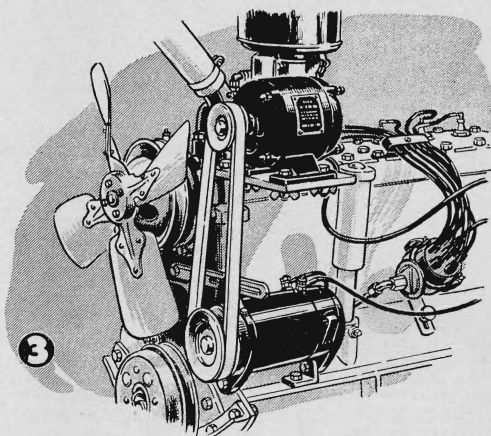
# HANDY AIDS FOR THE



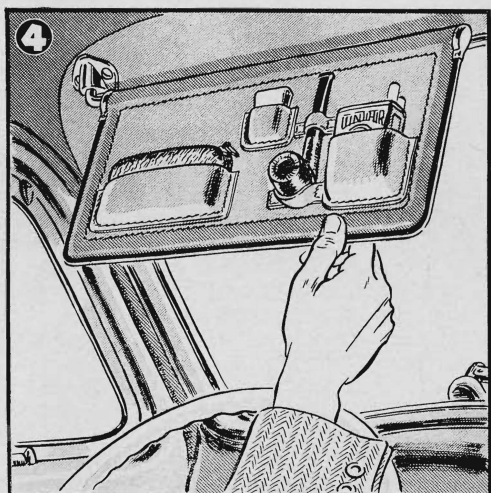
**1 DEFROSTER FANS**, which frequently are furnished new with plain on-off-type switches, can be made more flexible by replacing the original switch with a rheostat type such as most heater blowers have. The rheostat switch, available at most automobile-accessory stores, costs but a few cents and attaches easily under the dash.—P.V.



**2 WHEEL APPEARANCE** is improved by the simple expedient of applying white enamel to the wheel rims, as shown in the accompanying drawing. The resulting effect to the eye is that the car is equipped with white-wall tires. The area covered should extend only from the lip of the rim to the point where the drop-center rim is fastened to the wheel itself.—A.P.

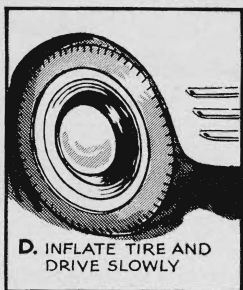
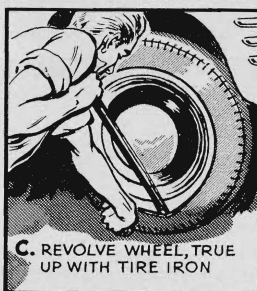
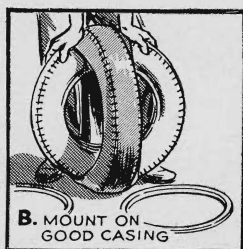


**3 LITTLE-USED BATTERIES** can be given an occasional charge with an old quarter-horsepower house-current motor plugged into a garage outlet and rigged on the car motor as shown. The electric-motor bed of iron can be permanently bolted to the car-motor studs, and the demountable motor connected to the generator pulley with a short V belt.—C.R.M.



**4 A HANDY SMOKER'S SET** for the motorist can be made of cut-out pieces of soft leather, sewn as indicated to the top side of one windshield visor. Material from a pair of old kid gloves should furnish all the leather needed.—D.McM.

# AUTOMOBILE OWNER



DRAWINGS BY STEWART ROUSE

**5 A HAT HOLDER** that will keep your hat off the car seat and floor while you are driving can be readily rigged up with a wire coat hanger and a strip of steel. Mount the unit as shown in the drawing by making use of one of the screws holding your rear-view mirror in place.—H.N.

**6 HOMEMADE TIRE CAPS**, good enough for slow, careful driving can be made by the method detailed in the series of drawings above. In cutting off the tire beads to make the cap, cut close to the bead welt. It is absolutely essential to use a tire of the same size as the one over which it is to be mounted.—T.D.

**7 BROKEN OR STRIPPED** threads in spark-plug holes of aluminum cylinder heads usually call for either a new head, or re boring and rethreading the hole for an oversize plug. a simpler repair is to bolt the plug down with a piece of strap iron, cut and drilled as shown to fit under the heads of two engine studs.—R.H.

**8 COMPARTMENTS** within your glove compartment will help bring order out of the chaos of articles that usually find their way into this handy catchall. Plywood, cut to your individual requirements and glued or nailed together, is excellent material for the device. Allow for hinge movement, and leave it free for easy removal when desired.—D.McM.

